NOTICE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

N 8260.56

1/5/06

Cancellation Date: 1/5/07

SUBJ: PRECISION CATEGORY II/III OBSTACLE ASSESSMENT AND REQUIREMENTS

1. PURPOSE. This notice provides Flight Standards' guidance for airport obstacle clearance criteria for precision Category (CAT) I, II, and III obstacle free zones (OFZ) and the relationship to glide slope antenna placement and taxiing/parked aircraft. Appendix 1 contains the current criteria and guidance for CAT I, II, and III OFZ. The three directives mentioned in paragraph 1 of appendix 1 provide the airport and facility requirements to support approval of CAT I, II, and III precision operations. Appendix 2 contains the Runway/Parallel Taxiway Separation.

2. DISTRIBUTION. This notice is distributed in Washington headquarters to the branch level in Offices of Airport Safety and Standards and Communications, Navigation, and Surveillance Systems; to Air Traffic, Airway Facilities, Aircraft Certification, and Flight Standards Services; to the National Flight Procedures Group and the Regulatory Standards Divisions at the Mike Monroney Aeronautical Center; to branch level in the regional Flight Standards, Airway Facilities, Air Traffic, and Airports Divisions; to Flight Standards District Offices (FSDOs); special mailing list ZVS-827; and to special military and public addressees.

3. BACKGROUND. This document is a safety initiative to publish current guidance for airport obstacle clearance criteria. This information was published in AC 120-29; however, when it was revised in August 2002, a recommendation was made to remove these criteria and place them in Order 8260.3B. The revision of AC 120.29A did not coincide with that of Order 8260.3B, so this guidance needs to be made available while it is being processed for inclusion in TERPS.

4. DISPOSITION. The criteria and standards provided in appendixes 1 and 2 will be published in Order 8260.3B, United States Standard for Terminal Instrument Procedures (TERPS).

Chester D. Dalbey for

James J. Ballough
Director, Flight Standards Service

Distribution: A-W(AS/ND/AT/AF/IR/FS)-3; AVN-100 (150 CYS); AMA-200 (80 CYS); A-X(FS/AF/AT/AS)-3; A-FFS-7 (STD); ZVS-827; Special Military and Public Addressees

Initiated By: AFS-420

APPENDIX 1. AIRPORT OBSTACLE CLEARANCE CRITERIA FOR PRECISION CATEGORY I, II, AND III OPERATIONS

1.0 GENERAL.

General precision obstacle clearance criteria are contained in Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS), Volume 3. Airport and facility requirements to support approval of Category (CAT) I, II, and III precision operations are contained in the latest editions of the following directives:

- AC 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach.
- AC 120-28, Criteria for Approval of Category III Weather Minima for Takeoff, Landing, and Rollout.
- Order 6750.24, Instrument Landing System and Ancillary Electronic Component Configuration and Performance Requirements.
- Order 8400.13, Procedures for the Approval of Special Authorization Category II and Lowest Standard Category I Operations.

2.0 ACCEPTABLE OBSTRUCTIONS.

Some equipment essential to flight operations is permitted in the obstacle free zones and/or specified TERPS surfaces. For the purposes of this document, the following components are “fixed by function,” and acceptable as obstructions (excluded from TERPS consideration) under the specified conditions. Any object “fixed by function” on a runway crossing or adjacent to a CAT II or III runway must also conform to the specified conditions.

2.1 ALL VISUAL AIDS ON FRANGIBLE MOUNTS.

Visual aids (to include visual glide slope indicator (VGSI)), taxiway signage, runway distance remaining markers, etc.) installed in accordance with Order 6850.2, Visual Guidance Lighting Systems, and AC 150/5340-18, Standards for Airport Sign Systems, are acceptable obstructions excluded from TERPS consideration.

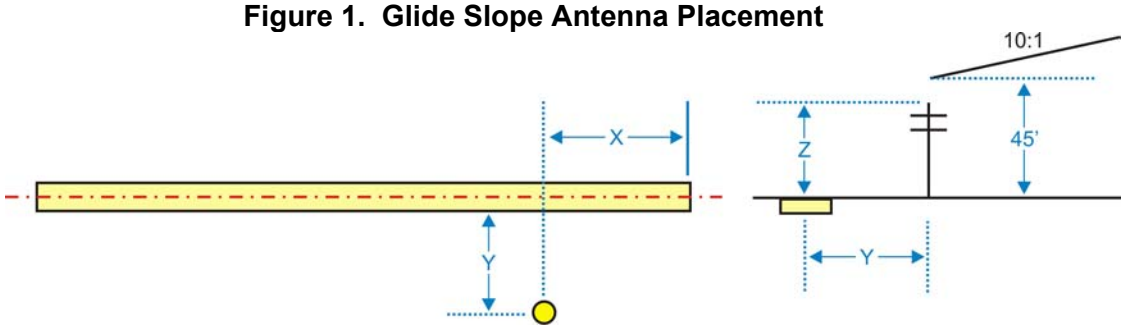
2.2 NAVIGATIONAL AID (NAVAID) AND METEOROLOGICAL SENSOR (AWOS/ASOS) COMPONENTS.

Glide slope shelter, precision approach radar (PAR), and runway visual range (RVR), components sited in accordance with AC 150/5300-13, Airport Design, and applicable siting standards are considered acceptable obstructions. AWOS/ASOS components sited in accordance with the ***Federal Standard for Siting Meteorological Equipment at Airports*** (http://www.ofcm.gov/siting/text/a-cover.htm) are also considered acceptable obstructions. Frangible PAR reflectors are not considered obstructions.

2.2.1 Glide Slope Antennas.

Glide slope antennas for CAT I procedures are not excluded from TERPS evaluation, and must remain clear of OFZs in accordance with AC 150/5300-13. For CAT II/III evaluations, glide slope antennas meeting the following standards are considered acceptable obstructions. Antenna location is referenced by measurement from the runway threshold along runway centerline (X), perpendicular distance from runway centerline (Y), and height above the runway centerline elevation abeam the antenna (Z). The minimum "Y" value (Ymin) is 250 ft for antenna masts with a "Z" value of 45 ft. For antenna masts with a "Z" value > 45 ft, the Ymin distance from runway centerline is increased 10 ft laterally for each foot the antenna height exceeds 45 ft. Calculate Ymin (see figure1).

Figure 1. Glide Slope Antenna Placement



$$Y_{min} = 10Z - 200$$

Simplified from

$$Y_{min} = 250 + 10(Z - 45)$$

2.3 AIRCRAFT CONSIDERATION AS OBSTACLES.

Taxiing, holding, and parked aircraft are considered obstructions for instrument procedure obstacle clearance application. In order to achieve the lowest landing minimums, aircraft must not penetrate the obstacle free zone (OFZ), final, or missed approach obstacle clearance surfaces (OCS), visual segment OCS, or the precision obstacle free zone (POFZ). Aircraft that penetrate the ***missed approach surface*** may be eliminated from TERPS consideration when compliant with the minimum runway/parallel taxiway standards from AC 150/5300-13 and as described below. Table 1 lists the aircraft design group standards applicable to this document.

Table 1. Aircraft Design Groups (ADG)

Group #	Tail Height (ft)	Wingspan (ft)
I	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262

2.3.1 CAT I Operations.

2.3.1 a. Design Groups I - V. Minimum runway/taxiway separation is as specified in AC 150/5300-13.

2.3.1 b. Design Group VI. Minimum runway/taxiway separation is 500 ft at sea level.

2.3.1 c. Increase minimum taxiway separation for airports above sea level using the formula:

$$A = (0.003E) \times 6 + D$$

Where E = Airport MSL elevation
A = Adjusted minimum taxiway separation
D = Minimum runway/taxiway separation for the Design Group

Example: Airport elevation 3,652 ft MSL
SIAP supports up to ADG IV
(400′ taxiway separation at sea level)

$A = (0.003 \times 3652) \times 6 + 400$
$A = 10.96 \times 6 + 400$
$A = 65.74 + 400$
A = 466 rounded to nearest ft

2.3.2 CAT II and III Operations.

2.3.2 a. Design Groups I-IV. Minimum runway/taxiway separation is 400 ft at sea level.

2.3.2 b. Design Group V. Minimum runway/taxiway separation is 500 ft at sea level.

2.3.2 c. Design Group VI. Minimum runway/taxiway separation is 550 ft at sea level.

2.3.2 d. Increase minimum taxiway separation described above for airports above sea level as follows:

Determine the values below:

$Y = 440 + (1.08S) - (0.024E)$
$B = 53 - 0.13S$
$C = B - (0.0022E)$

Where E = Airport MSL elevation
D = Minimum runway/taxiway separation for the Design Group
S = Wingspan of most restrictive aircraft (NOT SEMI-SPAN)
A = Adjusted minimum taxiway separation (round to nearest foot)

If Y ≥ D

$A = (0.0022E) \times 5 + D$

Example: Airport elevation: 841 MSL
Aircraft Design Group: V (D = 500 IAW 2.3.2b)
Wingspan of most restrictive aircraft: 214

$Y = 440 + (1.08 \times 214) - (0.024 \times 841)$
$Y = 440 + 231.12 - 20.18$
$Y = 671.12 - 20.18$
$Y = 650.94$ (Y ≥ D)

$A = (0.0022 \times 841) \times 5 + 500$
$A = 1.85 \times 5 + 500$
$A = 9.25 + 500$
$A = 509$

If Y < D

$A = 5(B - C) + (B - C) + D$

Example: Airport elevation: 5883 MSL
Aircraft Design Group: III (D = 400 IAW 2.3.2a)
Wingspan of most restrictive aircraft: 89

$Y = 440 + (1.08 \times 89) - (0.024 \times 5883)$
$Y = 440 + 96.12 - 141.19$
$Y = 536.12 - 141.29$
$Y = 394.83$ (Y < D)

$B = 53 - (0.13 \times 89)$
$B = 53 - 11.57$
$B = 41.43$

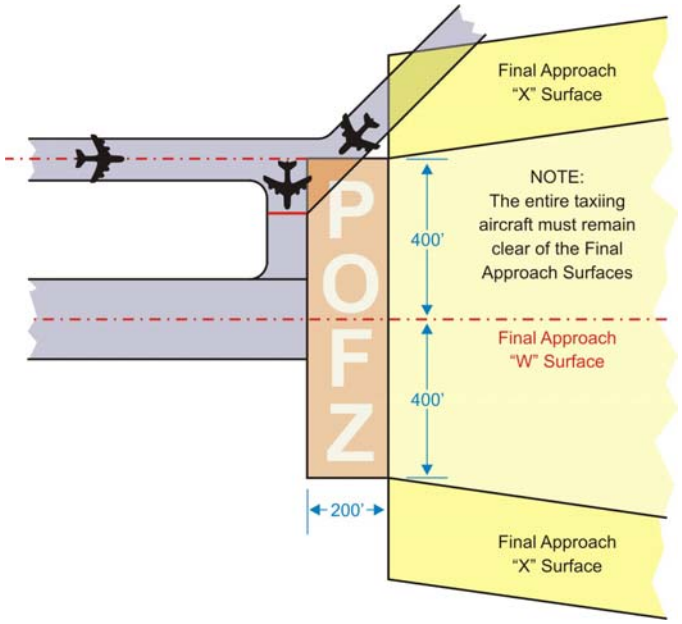
$C = 41.43 - (0.0022 \times 5883)$
$C = 41.43 - 12.94$
$C = 28.49$

A = 5 (41.43 - 28.49) + (41.43 - 28.49) + 400
A = 64.7 + 12.94 + 400
A = 478

2.3.3 Precision Obstacle Free Zone (POFZ). (Effective when reported ceiling is less than 250 ft and/or visibility less than ¾ SM or RVR 4000).

The tail and/or fuselage of a taxiing aircraft must not penetrate the POFZ when an aircraft flying a CAT I/II/III approach reaches 2 NM from threshold. The wing of aircraft holding on a perpendicular taxiway waiting for runway clearance may penetrate the POFZ, however, the fuselage or tail must not infringe the area. The MINIMUM authorized height above touchdown (HAT) and visibility for the approach is 250 ft and ¾ SM where the POFZ is not clear (see figure 2).

Figure 2. POFZ



2.4 FAILURE TO MEET STANDARDS AS AN ACCEPTABLE OBSTRUCTION.

Where the above standards cannot be met, consider the following actions to eliminate, limit, or mitigate a breach of the standards under paragraph 2.3.

2.4.1 Remove the obstacle.

2.4.2 Increase the DA.

2.4.3 Modify aircraft taxi routes.

2.4.4 Increase the Hold Line distance.

3.0 INSTRUMENT LANDING SYSTEM/MICROWAVE LANDING SYSTEM (ILS/MLS) CRITICAL AREA.

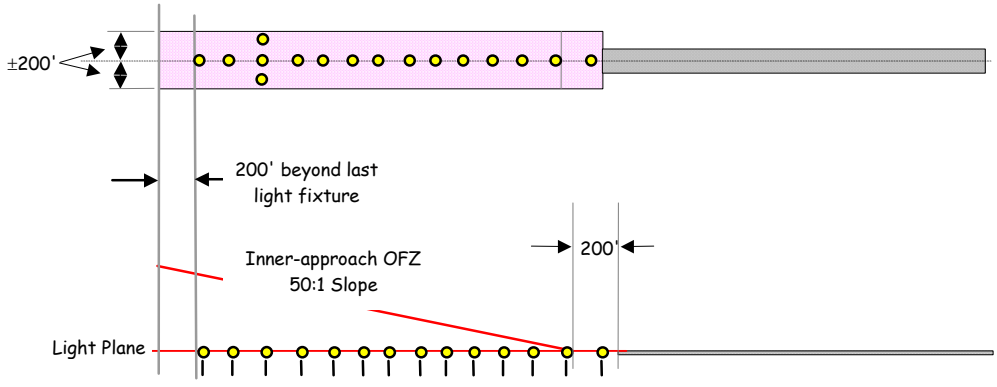
Precision approach system critical areas are described in Orders 6750.16, Siting Criteria for Instrument Landing Systems, and 6830.5, Criteria for Siting Microwave Landing Systems. CAT II/III ILS glide slope, localizer, and obstacle critical areas will be marked and lighted to ensure that ground traffic does not violate these areas during CAT II or III operations (except as allowed in Order 7110.65, Air Traffic Control).

4.0 APPROACH LIGHT PLANE AND INNER-APPROACH OFZ.

Airports operators are responsible for maintaining obstruction requirements associated with airport visual aids. Obstructions must not penetrate the approach light plane (see figure 3) or the inner-approach OFZ in accordance with AC 150/5300-13 and other applicable directives (Order 6850.2, AC 150/5340-30). For approach light plane clearance purposes, consider all roads, highways, vehicle parking areas, and railroads as vertical solid objects. Make the clearance required above interstate highways 17 feet, for railroads 23 feet, and for all other roads, highways, and vehicle parking areas 15 feet. Measure the clearance for roads and highways from the crown and edges of the road and make measurements for railroads from the top of rails. Make measurements for vehicle parking areas' clearances from the grade in the vicinity of the highest point. Airport service roads, where vehicular traffic is controlled in any manner that would preclude blocking the view of the approach lights by landing aircraft, are not considered as obstructions in determining the approach light plane.

NOTE: The OFZ clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible **visual NAVAIDs that need to be located in the OFZ because of their function. A localizer antenna serving the opposite runway end may penetrate the approach light plane if it does not obscure the approach lights or penetrate the inner-approach OFZ.*

Figure 3. Inner Approach OFZ and Approach Light Area Plane



5.0 REQUIREMENTS FOR CAT I PRECISION OPERATIONS.

5.1 OBSTACLE FREE ZONE (OFZ) REQUIREMENTS.

The OFZ requirements contained in AC 150/5300-13 appropriate for precision runways must be met to enable CAT I landing operations.

5.2 LIGHTING REQUIREMENTS.

See Order 8260.3, Volume 3.

5.3 MINIMUMS.

See Order 8260.3, Volume 3, table 2-2B.

5.4 FINAL AND MISSED APPROACH EVALUATIONS.

See Order 8260.3, Volume 3, chapters 1-3.

6.0 REQUIREMENTS FOR CAT II PRECISION OPERATIONS.

The CAT I requirements of paragraph 5 apply. In addition, the following criteria apply.

6.1 OFZ REQUIREMENTS.

Apply the OFZ standards described in AC 150/5300-13.

6.2 LIGHTING REQUIREMENTS (USN/USAF: apply appropriate military directives):

CAT II required lighting includes the following:

6.2.1 **United States (U.S.) Standard** ALSF-1 or ALSF-2 approach lights;

6.2.2 **U.S. Standard** touchdown zone lights;

6.2.3 **U.S. Standard** runway centerline lights; and

6.2.4 **U.S. Standard** high intensity runway lights.

NOTE: Exceptions to lighting criteria may be authorized only if an equivalent level of safety can be demonstrated by an alternate means. Examples of exceptions are: substitution for required approach lighting components due to an approved specific aircraft system providing equivalent information or performance (such as an autoland system, head up display (HUD) with inertially augmented flight path vector display), or availability of redundant, high integrity, computed or sensor based runway information (e.g., high resolution radar or approved enhanced flight vision systems (EFVS)), suitably displayed to a pilot.

6.3 SURFACE MOVEMENT GUIDANCE AND CONTROL SYSTEM (SMGCS).

Approved SMGCS operation per AC 120-57, Surface Movement Guidance and Control system, as required.

6.4 MARKING AND SIGNS.

Develop CAT II procedures only when the airport/runway meets applicable standards for taxiway markings and airport surface signs for CAT II precision operations (or ICAO equivalent at Non-United States airports). CAT II hold lines should be marked in accordance with 14 CFR Part 139.311 and AC 150/5340-1, Standards for Airport Markings. Runway markings must meet applicable standards to allow CAT II precision operations unless approved by AFS-400. Other guidance, such as Order 6750.24, Instrument Landing System and Ancillary Electronic Component Configuration and Performance Requirements, OpSpecs, and an approved SMGCS plan, may permit operational contingencies or exceptions. Examples of these actions are: snow removal, rubber deposit removal on runway touchdown zone markings or centerline markings, critical area hold line or runway centerline marking repainting, runway hold line sign snow removal, etc.

6.5 AN UNRESTRICTED CAT I PROCEDURE.

The CAT I final approach segment obstacle evaluation applies to the CAT II approach authorization. The CAT I procedure must support a 200-ft HAT and lowest possible visibility (no restrictions incurred by lack of infrastructure or obstacle surface penetrations).

NOTE: The final course alignment must be coincident with the runway centerline.

6.6 OPERATIONAL AIR TRAFFIC CONTROL TOWER (ATCT).

An operating on-airport ATCT must support CAT II ground and flight operations. If the ATCT does not provide continuous service, publish a note on the chart indicating the procedure is not authorized when the tower is closed.

6.7 APPROACH MINIMUMS.

CAT II procedures require special authorization from the FAA or appropriate military authority. AC 120-29 contains equipment and flight crew qualifications. Operators desiring lower than CAT I minimums require operations specifications (OpsSpecs) authorization for air carrier operations or a Letter of Authorization (LOA) for 14 CFR Part 91 operations. Table 2 lists lowest authorized minimums allowed by Order 8260.3. Higher minimums may be necessary based on environmental factors in the vicinity of the airport or other Flight Standards requirements. Class II/T/2 facility class of performance is required for CAT II operations. The lowest CAT II HAT/RVR values in feet are 100/1200. Table 2 lists RVR values for HAT values greater than 100.

Table 2. Lowest CAT II Minimums*

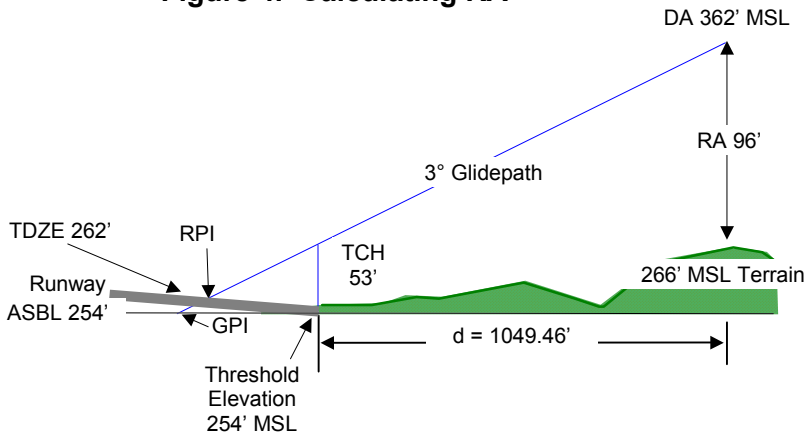
HAT (ft)	RVR (ft)
101-140 (1-40 adjustment)	1200
141-180 (41-80 adjustment)	1600
181-199 (81-99 adjustment)	1800

**NOTE: Chart only one set of minimums indicating the lowest authorized CAT II HAT.*

6.7.1 Calculation of Radio Altimeter (RA) Height.

To determine RA height, determine the distance (d) from LTP to the point decision altitude (DA) occurs. Obtain the terrain elevation on final approach course at distance (d) feet from LTP. Subtract the terrain elevation from the DA to calculate the RA (see figure 4).

Figure 4. Calculating RA



$$d = \frac{DA - (\text{Threshold Elev} + TCH)}{\tan(GPA)} \Rightarrow d = \frac{362 - (254 + 53)}{\tan(3)} \Rightarrow d = 1049.46 \text{ from LTP}$$

$$RA = DA - \text{terrain elevation} \Rightarrow RA = 362 - 266 \Rightarrow RA = 96 \text{ ft}$$

6.8 ADJUSTMENT OF CAT II MINIMUMS.

The HAT is measured in feet from the highest elevation of the runway in the touchdown area (first 3,000 ft of runway), and visibility in RVR reported in feet. The lowest attainable values are a HAT of 100 ft and RVR of 1,200 ft. Application of CAT II obstruction clearance criteria may identify objects that exceed the allowable height in surface "A" or penetrate the approach light surface (except allowable localizer antenna, see paragraph 4.0 Note). In such cases, adjustment to the decision altitude (DA) must be made as follows:

NOTE: If DA adjustments result in a HAT greater than or equal to 200, revert to CAT I criteria.

6.8.1 Penetrations of the Final Approach Surface.

6.8.2 Penetrations of the primary (W, X) surfaces are not authorized.

Taxiing, holding, and parked aircraft are obstructions in the final segment analysis. Apply Order 8260.3, Volume 3, paragraph 3.6.3 to obstruction penetrations in the "Y" surface, except paragraph 3.6.3c is not applicable (see paragraph 6.5 Note).

6.8.3 Inner-Approach OFZ and Missed Approach Surface "A."

Adjust the DA upward one-foot for each foot of surface penetration. The RVR value may require adjustment as specified in table 2.

6.9 MISSED APPROACH SEGMENT.

6.9.1 Section 1.

The area begins at the end of the final OCS trapezoid and is aligned with a continuation of the final approach course, continuing in the direction of landing for a distance of 1.5 NM. It is comprised of 5 subsections; section A, section B, section C, section D, and section A1 (see figure 5). Section 1 OCS surfaces must not be penetrated except for those obstacles specified in paragraph 2.0. (with the exception of A1 surface extended, see paragraph 6.9.2b) Use the following formulas to calculate the MSL height of the OCS at any given distance (**X**) from threshold and (**Y**) from runway centerline:

h = MSL height of OCS
X = distance (ft) from runway threshold measured parallel to runway centerline
Y = perpendicular distance (ft) from runway centerline
e = MSL elevation of the runway centerline at distance **X**
f = MSL elevation of the runway centerline 3,000 ft from threshold
k = increase in surface width due to altitude:

If airport elevation ≤1000 MSL then $k = 0$ or

if airport elevation >1000 MSL then $k = 0.01(airportelev - 1000)$

CASE 1. Where **X** ≤ 3000′ and:

Y < (200+k): $h = e$ A surface

Y ≥ (200+k): $h = \frac{11(Y - (200 + k))}{40} + e$ B surface

Y > (400+k): $h = \frac{7(Y - (400 + k))}{40} + 55 + e$ C surface

Y > (600+k): $h = \frac{Y - (600 + k)}{10} + 90 + e$ D Surface

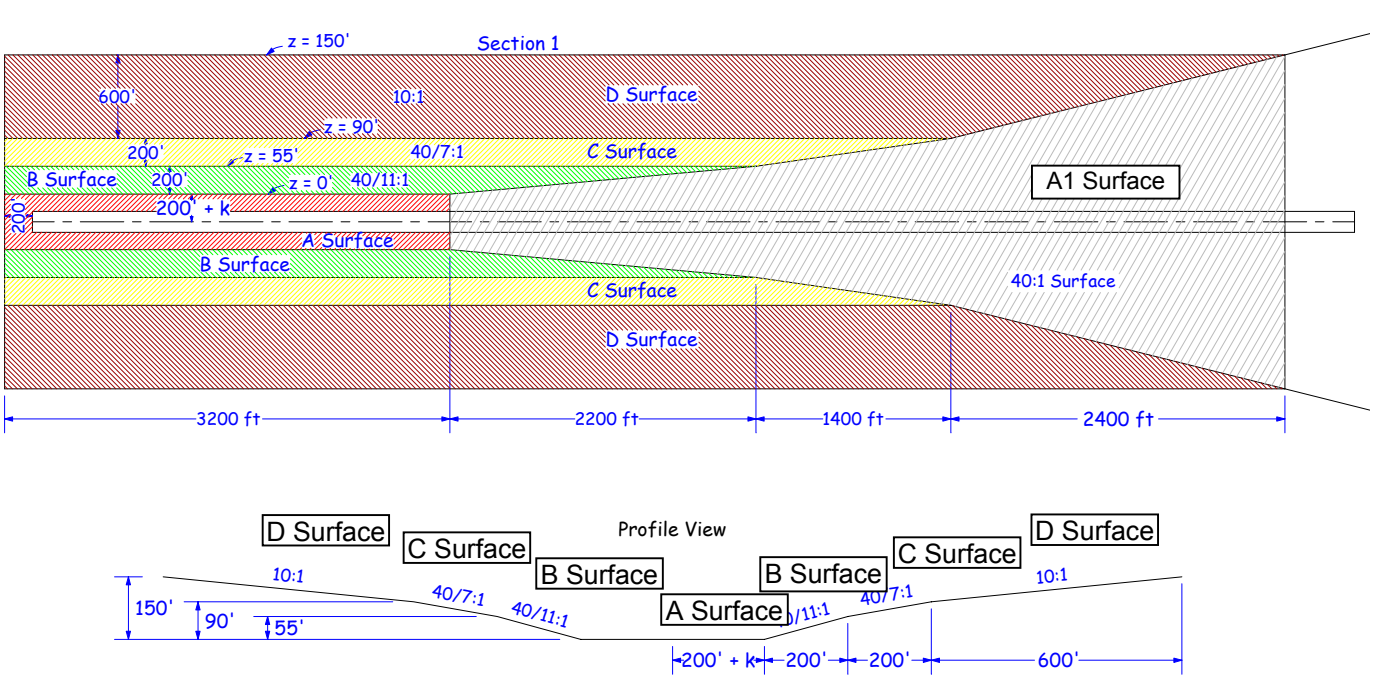
CASE 2. Where **X** > 3000' and: (Calculate h using the following formulas, select highest value of the 2 results)

Y > (200+k): $h = \frac{11(Y-(200+k))}{40} + f$ (B surface), $h = \frac{x-3000}{40} + f$

Y > (400+k): $h = \frac{7(Y-(400+k))}{40} + 55 + f$ (C surface), $h = \frac{x-3000}{40} + f$

Y > (600+k): $h = \frac{Y-(600+k)}{10} + 90 + f$ (D surface), $h = \frac{x-3000}{40} + f$

Figure 5. CAT II/III Missed Approach Section 1



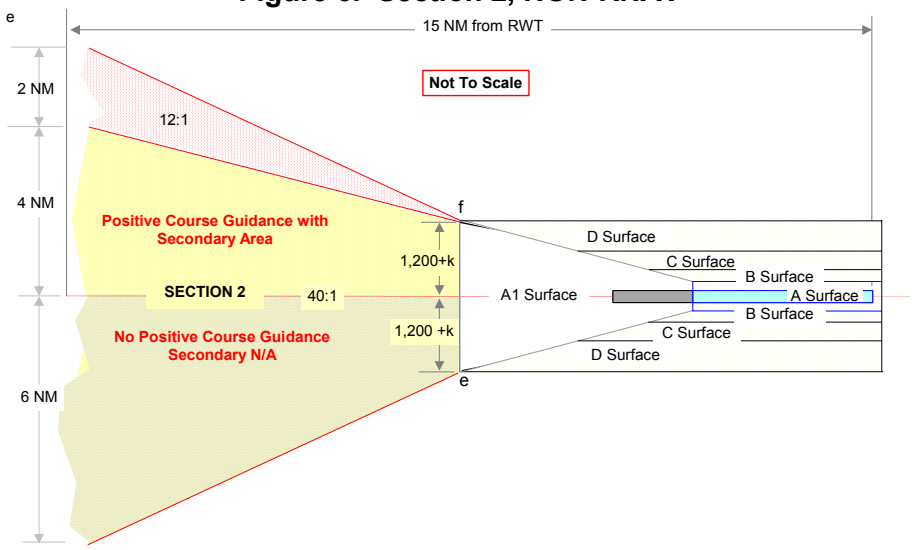
Where RWY elev ≤ 1000', k = 0
Where RWY elev > 1000', k = .01(e - 1000')

6.9.2 Section 2.

See figure 6.

6.9.2 a. Straight-Ahead Missed Approach Area (applies to turns 15° or less). This area starts at the end of the A1 surface and is centered on the specified missed approach course. The width increases uniformly from +/- (1200 + k) feet at the beginning to en route width at a point 15 miles from the runway threshold. When positive course guidance is provided for the missed approach procedure, secondary reduction areas that are zero miles wide at the point of beginning and increase uniformly to initial width may be added to section 2 (see figure 6).

Figure 6. Section 2, NON-RNAV



6.9.2 **b. Turning Missed Approach Area.** (Applies to turns of more than 15°). See figures 7, 8, and 9. Missed approach section 1 obstacle clearance surface is based on the assumption that aircraft will be 200 ft above the runway elevation at the end of the A surface at the nominal end of the A1 surface. However, the design of the turning missed approach area must consider that aircraft executing a missed approach will climb straight ahead until reaching a height of at least 400 ft above the TDZE. The A1 surface area must be extended longitudinally using the following formula:

$$d = (T_{MSL} - (A_{MSL} + 200)) * Slope$$

d = A1 surface extension distance in feet
A_{MSL} = Runway elevation at end of A surface
T_{MSL} *= Turn height (as a minimum, TDZE + 400)*
Slope = 6076.11548/CG.

NOTE: For special procedures requiring a climb gradient A1 surface extended may be shortened (see figure 10).

The A1 surface extended OCS will continue to slope at 40:1 and the area will splay at 15 degrees from the nominal end of A1 surface width until reaching the turn altitude/point. Apply the applicable turning flight track/outer boundary radius (see Order 8260.3 Volume 1, chapter 2, table 5) both originating on the line marking the end of A1 surface extended. Unless a fix/facility identifies the turn point, the inner boundary line must commence at the inside turn edge of the D surface opposite the end of the touchdown area (A surface). When the turn point is marked by a fix/facility, the inside tieback may be constructed relative to the end of the A1 surface extended (see Order 8260.3 Volume 1, paragraph 277). When the point on the inside turn side of section 2 area abeam the clearance limit is past an imaginary line extended perpendicular to the edge of section 1 abeam the end of the touchdown zone on inside turn side, the inner boundary line commences on the outside turn edge of the D surface opposite the end of the touchdown area (A surface). See figure 9. The outer and inner

boundary lines extend to points each side at flight track at the clearance limit at a rate that achieves initial segment width 15 miles from the runway threshold. Where secondary areas are required, they must commence after completion of the turn at the point where PCG is achieved.

Figure 7. Turning Missed Approach

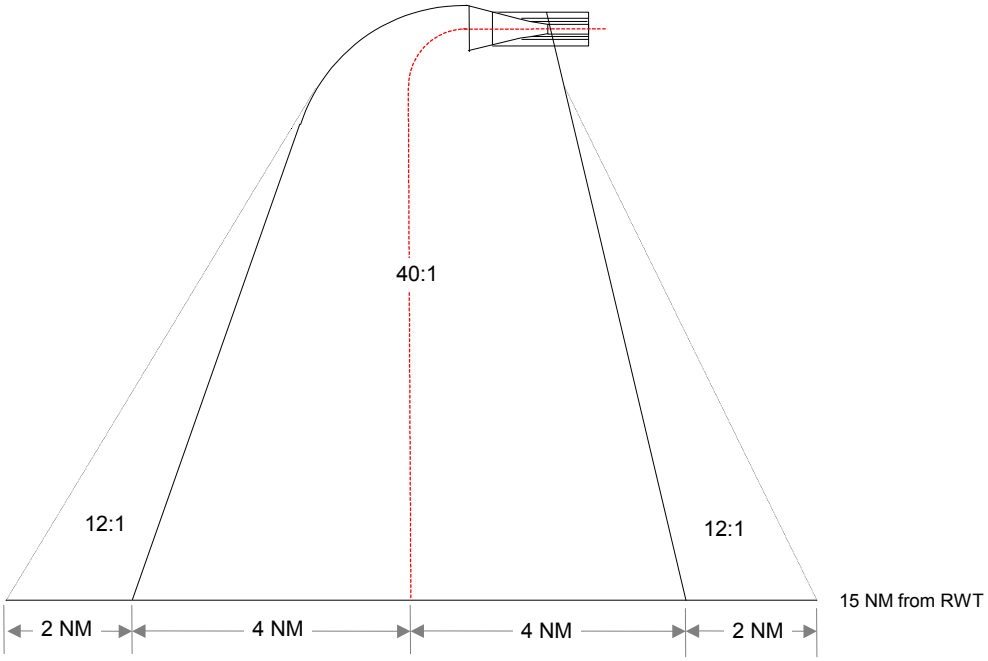


Figure 8. Turning Missed Approach Detail (CAT D)

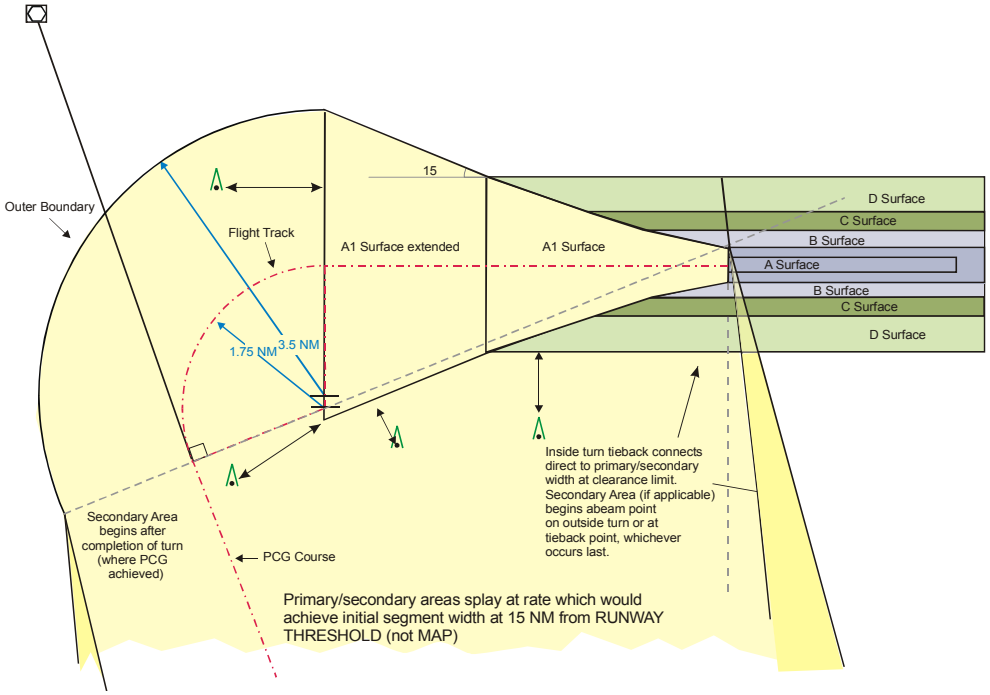
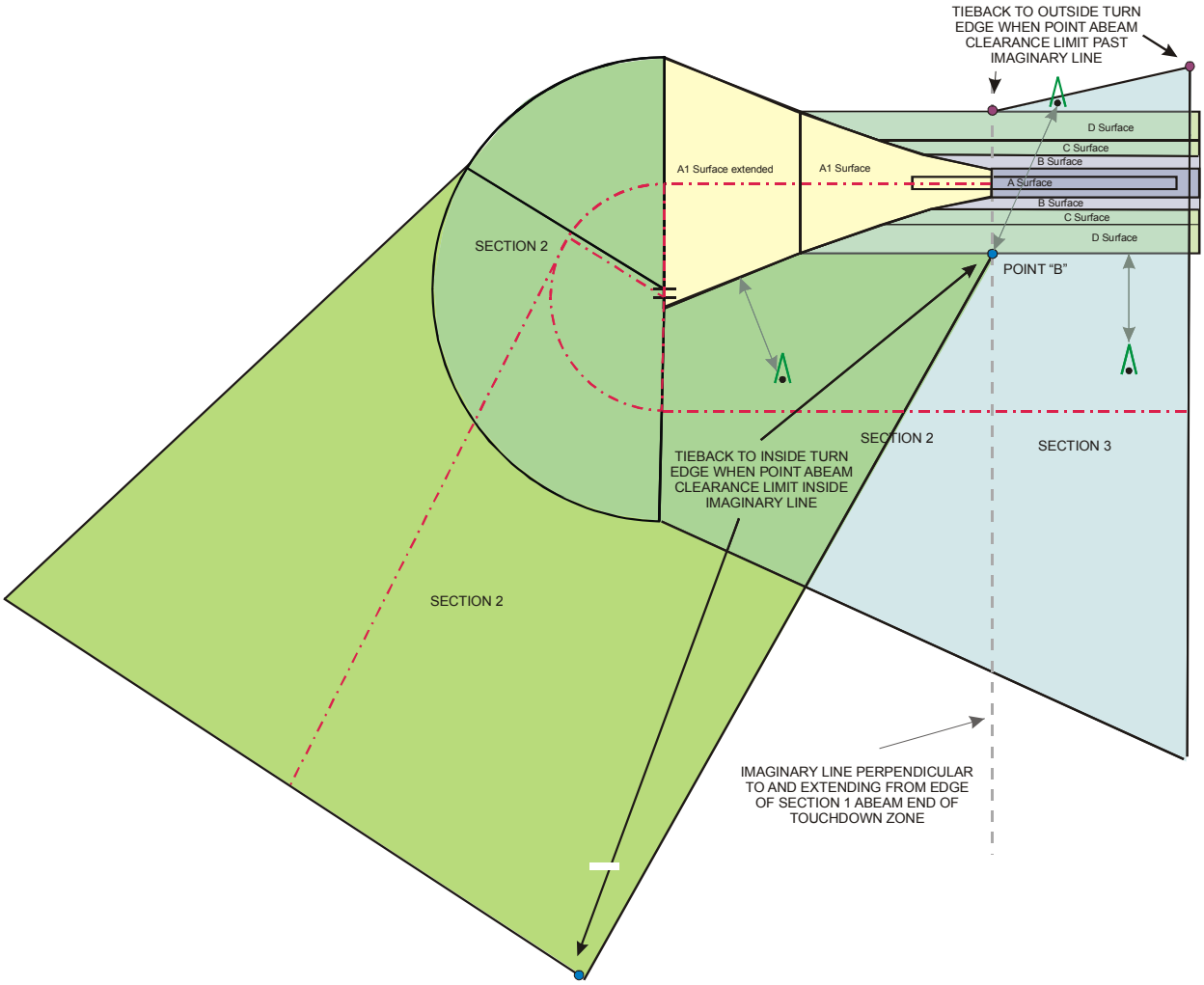


Figure 9. Turning Missed Approach Inside Tieback



6.9.2 c. Section 2, Obstacle Clearance.

Section 2 OCS is a 40:1 inclined plane originating at the end of section 1. Beginning height is equivalent to the end of the A1 surface height on centerline. When the A1 surface is extended for turning missed approach, section 2 originates at the end of the A1 surface extended, and the beginning height is equivalent to the A1 extended surface height on centerline. Obstacles in section 2 are measured to the nearest edge of section 1 (or to the A1 surface extended). Section 3 is necessary for turns more than 90° as described in Order 8260.3 Volume 1, paragraph 276b, except point "B" is defined as the point of the inside of turn edge of section 1 abeam the end of the A surface regardless of the location of the inside tieback point (see paragraph 6.9.2b). When an object penetrates the 40:1 surface in the A1 surface extended or section 2, a **public** procedure is not authorized. A **special** procedure (see Order 8260.19 chapter 4, section 4) with a missed approach climb gradient > 200 ft/NM may be constructed consistent with Order 8260.3 Volume 3, paragraph 3.9.3. The missed approach procedure will contain a note specifying the minimum rate of

climb required to clear the obstruction by the number of feet determined by the following formula:

$$\mathbf{c} = \frac{\mathbf{h} - \mathbf{e}}{0.76\mathbf{d}} \quad \text{Example:} \quad \frac{619 - 112}{0.76 \times 2} = 333.55 \ {}^{ft}/_{NM} \text{ round up to } 334 \ {}^{ft}/_{NM}$$

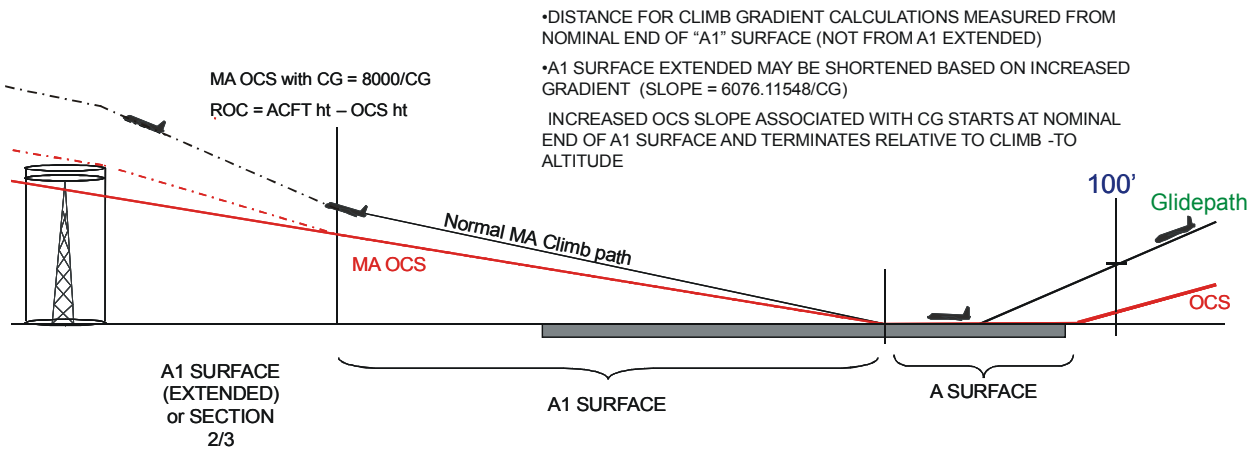
Where c = climb gradient (ft/NM)
h = obstruction MSL elevation - elevation of runway at end of A surface
e = centerline height at nominal end of A1 surface
d = in A1 surface extended, shortest distance in NM to line marking nominal end of A1 surface. In section 2/3, distance in NM from nominal end of A1 surface to A1 surface extended + distance to nearest edge of section 1 (to include A1 surface extended).

The climb gradient is effective until reaching the hundred-foot (3100; 1600; etc.) altitude equal to the height of the obstruction + ROC. Do not specify climb gradients less than 200 ft per NM.

Example:

Chart planview note: Missed Approach obstructions require a minimum climb gradient of (number) ft/NM to (altitude)."

Figure 10. Missed Approach Climb Gradient (Special Procedures)



7.0 REQUIREMENTS FOR CAT III PRECISION.

AC 120-28 refers to use of International Civil Aviation Organization (ICAO) Annex 10 criteria, Order 6750.24, and the applicable NAVAID classification for CAT III operations. NAVAID use is predicated on applicable ILS, MLS, or GLS performance classifications; e.g., ILS III/E/3, GLS II/D/3, or equivalent classification at non-U.S. facilities. For GLS, an appropriate equivalent

performance classification to ILS, as specified by FAA or the ICAO, may also be used; e.g., Performance Level/Coverage/Integrity as in "II/T/2." Threshold crossing height (TCH) requirements contained in Order 8260.3, Volume 3, paragraph 2.6 applies. Except as noted below, the above criteria for CAT II precision applies.

7.1 REQUIREMENTS FOR LOWER THAN CAT II (RVR 1200) OPERATIONS.

7.1.1 Lighting Requirements.

Lead on/off lights are required to approve operations below RVR 600.

7.1.2 Surface Movement Guidance and Control System (SMGCS).

Approved SMGCS operation per AC 120-57, as required.

7.2 MINIMUMS.

Publish the lowest authorized CAT III RVR when the runway supports unrestricted CAT II operations. When CAT II operations for a runway are restricted, CAT III minimums for the runway must be determined by collision risk analysis. The following minimum RVR standards are applicable to published CFR Part 97 CAT III Standard Instrument Approach Procedures (SIAP) based on equipment performance class (see Order 6750.24):

7.2.1 Class III/D/3 - RVR $\geq$ 700.

NOTE: CAT III procedures with facility class III/D/3 performance require the notation "Localizer not suitable for Electronic Rollout Guidance."

7.2.2 Class III/E/3 - RVR $\geq$ 600.

7.2.3 Class III/E/4 - RVR < 600.

APPENDIX 2. RUNWAY/PARALLEL TAXIWAY SEPARATION CALCULATOR

http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs420/terps_tools/media/AOSC.xls

Parallel Taxiway separation required to remain clear of TERPS CAT II/III ILS Missed Approach Surfaces

Directions: Enter the appropriate value in boxes with a blue background. The value output in red provides the height above the runway surface of the CAT II/III TERPS missed approach surface at the corresponding point.

Step 1: Enter Airport elevation (MSL) = 800

Step 2: Enter Taxiway "X" distance from threshold** = 200

Step 3: Enter Taxiway distance from rwy centerline = 400

Height of TERPS surface ***55***

** - Distances prior to the "Y" axis (line perpindicular to centerline at runway threshold) are positive "X", distances after "Y" axis are negative "X"